

Claims

What is claimed is:

1. A method of capturing and processing information from a plurality of forms concurrently, said forms being randomly positioned on a moving conveyor belt, such that the form is visible to an imager, the method comprising the steps of:

capturing an image of said conveyor belt;

locating at least one of said plurality of forms in said captured image, said at least one form is comprised of a plurality of information data fields; and

decoding at least one of said plurality of information data fields.

2. The method of claim 1 including the step of repeating the locating and decoding steps until every form in said captured image has been processed.

3. The method of claim 1 wherein said image is comprised of a plurality of non-singulated forms.

4. The method of claim 3 wherein said captured image is comprised of a plurality of unjustified forms.

5. The method of claim 1 wherein said locating step is further comprised of the steps of:

5 locating a predetermined pattern in said captured image;
 locating at least one fiduciary mark in said captured image, said at least one fiduciary
 mark does not exceed a predetermined distance from said predetermined pattern; and
 determining a region of interest, said region of interest circumscribes an area including
10 said predetermined pattern and said at least one fiduciary mark.

6. The method of claim 5, wherein said predetermined pattern is a machine
 readable code.

7. The method of claim 5, wherein said predetermined pattern is numeric,
15 alphanumeric, or alphabetic text.

8. The method of claim 5, wherein said predetermined pattern is a picture.

9. The method of claim 5 wherein said step of locating a predetermined pattern is
20 further comprised of the steps of:

 determining that a portion of said predetermined pattern is missing from said captured
 image; and

 combining said captured image with at least one prestored image to create a complete
25 predetermined pattern.

5 10. The method of claim 5 wherein said determining step is further comprised of
the steps of:

 determining that a portion of the region of interest is missing from said captured
image; and

 combining said captured image with at least one prestored image to create a complete
10 region of interest.

 11. The method of claim 1 wherein said decoding step is comprised of the steps of:
 measuring a spatial relationship between at least one fiduciary mark and a
predetermined pattern, said spatial relationship identifying a location and format of at least
15 one of said plurality of information data fields located on said form; and
 decoding at least one of said plurality of information data fields.

 12. The method of claim 11 wherein the decoding step is comprised of the
following steps:
20 identifying a originating source associated with said form;
 extracting information from at least one of said information data fields;
 decoding said extracted information using a recognition engine, wherein said
recognition engine is determined by the location and format of said information data field;
 comparing said decoded information with a database entry of package information
25 associated with said originating source; and

5 replacing said decoded information with said package information, provided a predetermined criteria is met.

13. The system of claim 12 further comprising of the step of re-ordering said package information database, provided a predetermined criteria is met.

10 14. A computer system for capturing and processing information from a plurality of forms traveling on a conveyor belt, concurrently, comprising:

a memory having program instructions; and

15 a processor configured to use the program instructions to capture an image of said plurality of forms; to locate at least one of said plurality of forms in said captured image, wherein said at least one form is comprised of a plurality of information data fields; and to decode the information on said at least one of said plurality of forms.

20 15. The computer system according to claim 14, wherein the processor is further configured to repeat the locating and decoding instructions until every form in said captured image has been processed.

16. The computer system according to claim 14 wherein the locating instruction is further comprised of the following instructions:

25 locate a predetermined pattern in said captured image;

5 locate at least one fiduciary mark in said captured image, wherein said at least one
fiduciary mark does not exceed a predetermined distance from said predetermined pattern; and
determine a region of interest, wherein said region of interest circumscribes an area
including said predetermined pattern and said at least one fiduciary mark.

10 17. The computer system according to claim 14, wherein the locating a
predetermined pattern instruction is further comprised of the following instructions:
determine that a portion of said predetermined pattern is missing from said captured
image; and
combine the captured image with at least one prestored image to create a complete
15 predetermined pattern.

18. The computer system according to claim 16, wherein the determining
instruction is further comprised of the following instructions:
determine that a portion of the region of interest is missing from said captured image;
20 and
combine the captured image with at least one prestored image to create a complete
region of interest.

19. The computer system according to claim 14, wherein the decoding instruction
25 is further comprised of the following instructions:

5 measure a spatial relationship between at least one fiduciary mark and a predetermined pattern, said spatial relationship identifying a location and format of at least one of said plurality of information data fields located on said form; and
 decode at least one of said plurality of information data fields.

10 20. The computer system according to claim 19, wherein the decoding instruction is further comprised of the following instructions:

 identify a originating source associated with said form;
 extract information from at least one of said information data fields;
 decode said extracted information using a recognition engine, wherein said recognition
15 engine is determined by the location and format of said information data field;
 compare said decoded information with a database entry of package information associated with said originating source; and
 replace said decoded information with said package information, provided a predetermined criteria is met.

20 21. The system of claim 20 further comprising of the instruction to reorder said database entry of package information, provided a predetermined criteria is met.

 22. A system for capturing and processing information from a plurality of forms
25 concurrently, said forms being randomly positioned on a moving conveyor belt such that the form is visible, said system comprising:

5 means for capturing an image of said conveyor belt;
 means for locating at least one of said plurality of forms in said captured image,
 wherein said at least one form is comprised of a plurality of information data fields; and
 means for decoding the information on said at least one of said plurality of forms.

10 23. The system of claim 22 including means for executing the means for locating
 and the means for decoding until every form in said captured image has been processed.

 24. The system of claim 22, wherein the means for locating is further comprised of:
 means for locating a predetermined pattern in said captured image;
15 means for locating at least one fiduciary mark in said captured image, said at least one
 fiduciary mark does not exceed a predetermined distance from said predetermined pattern; and
 means for determining a region of interest, said region of interest circumscribes an area
 including said predetermined pattern and said at least one fiduciary mark.

20 25. The system of claim 24, wherein the means for locating is further comprised of:
 means for determining that a portion of said predetermined pattern is missing from
 said captured image; and
 means for combining said captured image with at least one prestored image to create a
 complete predetermined pattern.

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5 26. The system of claim 24, wherein the means for determining is further
comprised of:

 means for determining that a portion of the region of interest is missing from said
captured image; and

 means for combining said captured image with at least one prestored image to create a
10 complete region of interest.

 27. The system of claim 22 wherein the means for decoding is further comprised
of:

 means for measuring a spatial relationship between at least one fiduciary mark and a
15 predetermined pattern, said spatial relationship identifying a location and format of at least
one of said plurality of information data fields located on said form; and

 means for decoding at least one of said plurality of information data fields.

20 28. The system of claim 27 wherein the means for decoding is further comprised
of:

 means for identifying an originating source associated with said form;

 means for extracting information from at least one of said information data fields;

 means for decoding said extracted information using a recognition engine, wherein
said recognition engine is determined by the location and format of said information data
25 field;

5 means for comparing said decoded information with a database entry of package information associated with said originating source; and

means for replacing said decoded information with said package information, provided a predetermined criteria is met.

10 29. The system of claim 28 further comprising of means for re-ordering said package information database, provided a predetermined criteria is met.

15 30. A method of accessing package routing information on a computer network involving at least one user terminal and at least one alias server, said method comprising the steps of:

inputting information at a user terminal to retrieve package routing information, wherein said inputted information contains package identification required by said at least one alias server to retrieve said package routing information;

transmitting said inputted information from said user terminal to said alias server; and

20 transferring package routing information from said alias server to said user terminal, provided said alias server locates a database record corresponding to said inputted information.

25 31. The method of claim 30, wherein said step of transferring package routing information further comprises the step of accessing a package information server by said alias server.

5 32. The method of claim 30, wherein said step of transferring package routing information further comprises the step of accessing a package tracking database by said alias server.

10 33. A computer system for accessing package routing information on a computer network involving at least one user terminal and at least one alias server, comprising:

 a memory having program instructions; and

 a processor configured to use the program instructions to access customer-inputted information for retrieving package routing information, wherein said inputted information contains package identification required by said at least one alias server to retrieve said package routing information; to transmit said inputted information from said user terminal to said alias server; and to transfer package routing information from said alias server to said user terminal, provided said alias server locates a database record corresponding to said inputted information.

20 34. The computer system according to claim 33, wherein the transferring instruction further comprises the instruction to access a package information server by said alias server.

25 35. The computer system according to claim 33, wherein the transferring instruction further comprises the instruction to access a package tracking database by said alias server.

5 36. A computer system for accessing package routing information on a computer network involving at least one user terminal and at least one alias server, said system comprising:

 means for inputting information at a user terminal to retrieve package routing information, wherein said inputted information contains package identification required by
10 said at least one alias server to retrieve said package routing information;

 means for transmitting said inputted information from said user terminal to said alias server; and

 means for transferring package routing information from said alias server to said user terminal, provided said alias server locates a database record corresponding to said inputted
15 information.

 37. An imaging system for capturing a non-singulated image of a plurality of forms traveling on a moving conveyor belt, comprising:

 a primary lens assembly for converging a beam of light emitted from a surface of a
20 conveyor belt towards a secondary lens assembly;

 a secondary lens assembly for converging said beam of light from said primary lens assembly towards an image detector;

 a phase mask positioned between said secondary lens assembly and said image detector for altering said beam of light such that said imaging system is insensitive to small
25 distances between objects positioned on said conveyor belt and said image detector;

5 a beamsplitter disposed between said phase mask and said image detector for splitting
said beam of light to a plurality of image detectors;

 a first image detector for generating an output signal of a first portion of said conveyor
belt; and

 a second image detector for generating an output signal of a second portion of said
10 conveyor belt, said second image detector disposed at a 90° angle from said first image
detector.

38. The imaging system of claim 37, wherein the phase mask is encoded with a
separable point spread function.

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